



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/792,323	03/03/2004	Lawrence C. Lei	AMAT/5191C1/ISM/CORE/MCVD	4370

44257 7590 02/21/2008
PATTERSON & SHERIDAN, LLP
3040 POST OAK BOULEVARD, SUITE 1500
HOUSTON, TX 77056

EXAMINER

PAIK, SANG YEOP

ART UNIT	PAPER NUMBER
----------	--------------

3742

MAIL DATE	DELIVERY MODE
-----------	---------------

02/21/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/792,323

Applicant(s)

LEI, LAWRENCE C.

Examiner

Sang Y. Paik

Art Unit

3742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-24, 29-34, 36, 37 and 39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-24, 29-34, 36, 37 and 39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 22-24, 29-31 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onoe et al (US 6,270,839) or Suntola et al (US 4,389,973) in view of Arnold et al (US 5,224,202) or Horsky (US 6,452,338).

Onoe shows the apparatus for vaporizing a solid precursor claimed including a housing with at least two spaced surfaces such as the stainless steel mesh or wires with a solid precursor applied thereto, a heating member in thermal communication with the two surfaces and the housing (also see Figure 1), and an outlet that is connected to a growth chamber of a CVD apparatus. Suntola also shows the apparatus claimed including a housing with a carrier gas inlet, an outlet, at least two surfaces containing a solid precursor spaced to allow passage of the carrier gas therebetween, a heating member or source in thermal communication such as in thermal conduction for heating the wall of the housing and the at least two surfaces. Suntola also shows that heating element (56) can be provide with the precursor applied or contained surface

But, Onoe and Suntola do not show the heating member contained within the wall of the housing.

Arnold and Horsky show that it is well known in the art to provide a heating element contained within the wall of the housing to vaporize the materials contained therein. In view of

Art Unit: 3742

Arnold or Horsky, it would have been obvious to one of ordinary skill in the art to adapt Onoe or Suntola with the heating members contained within the wall of the housing as an another effective alternative heating arrangement to heat the precursor contained in the housing.

With respect to the recited ALD chamber, Suntola shows that it is known in the art that that the vaporized precursor is applied for the CVD or ALE (atomic layer Epitaxy) for the film deposition or growth. The applicant also describes in the application's background that such CVD and ALD depositions are well known in the art. Thus, it would have been obvious to one of ordinary skill to adapt the vaporization apparatus with the ALD deposition chamber or any other known chamber for the desired vaporized film depositions.

With respect to the recitation of solid precursors being tantalum or tungsten, it is noted that these recitations relate to the materials or articles worked upon by the apparatus, and they do not limit the apparatus claims. MPEP 2115.

3. Claims 32-34, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over s as applied Onoe or Suntola in view of Arnold or Horsky to claims 22-24, 29-31 and 39 above, and further in view of Gartner et al (US 4,947,790) or Loan et al (US 6,296,711).

Onoe or Suntola in view of Arnold or Horsky shows the apparatus claimed except for cone shaped surfaces.

Arnold shows the cone shaped surface, and Gartner and Loan are applied to further shows such cone shaped surface is well known in the art. Particularly, Gartner shows a solid precursor applied surface including a cone shaped surface as well as a linear and a U-shaped surface to hold the precursor and to allow the vaporization of the precursor upon heating. Gartner also teaches that solid precursor containing bed (13) is made of quartz which is a ceramic

Art Unit: 3742

material. Loan also shows a precursor is applied to a cone shaped surface for the vaporization of such precursors. Loan also shows that it is also known in the art to provide a heater contained within the cone shaped surface to provide the vaporization heating.

In view of Gartner or Loan, it would have been obvious to one of ordinary skill in the art to adapt Onoe or Suntola, as modified by Arnold or Horsky, with the various shapes or surfaces including a cone-shaped surface as an alternative surface arrangement to conveniently support and hold a precursor, including a solid precursor, for a more effective vaporization of such precursor materials.

Response to Arguments

4. Applicant's arguments filed 11/19/07 have been fully considered but they are not persuasive.

The applicant argues Onoe and Suntola do not show positioning a heating device within the wall of the housing container (1). It is noted that such structure is taught by the secondary references, Arnold or Horsky, as applied in the ground of rejection. The applicant then further argues Arnold which is used to vaporize the liquid material fails to meet the recited solid precursor fails to meet the claimed invention, and the applicant argues Horsky fails to show any inlet for providing a carrier gas which teaches away from any carrier gas introduction. It is noted that Arnold and Horsky are alternatively applied to show that it is well known in the art to provide a heating member/device in a wall of the housing to vaporize the material contained therein, and as stated in the ground of rejection, such heating element arrangement would have been obvious as an alternative means to also effectively heat the material provided in the container of Onoe or Suntola. There is no other contrary teaching to teach away such alternative

Art Unit: 3742

heating arrangement. Furthermore, the different materials being heated by Arnold does not teach away any motivation to combine the applied prior art since the material that is worked upon by an apparatus does not limit the apparatus claim (MPEP 2115).

With respect to ALD chamber, it is also noted the applicant also discloses the conventional known techniques such as the CVD and ALD to develop the solid films on a substrate, and Onoe or Suntola which also uses its vaporizer in the CVD chamber would have allow one of ordinary skill in the art to use such vaporizer in ALD.

With respect to Gartner or Loan, it is noted that these references were applied to teach the cone shaped surfaces and not the heating elements arrangement.

Thus, the applicant's arguments are not deemed persuasive.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 3742

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y. Paik whose telephone number is 571-272-4783. The examiner can normally be reached on M-F (6:30-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Hoang can be reached on 571-272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sang Y Paik

Primary Examiner

Art Unit 3742



syp